Building Resilient Infrastructure and Communities (BRIC) and Building Codes

July 15, 2020

Photo of Memphis, Tennessee

FEMA

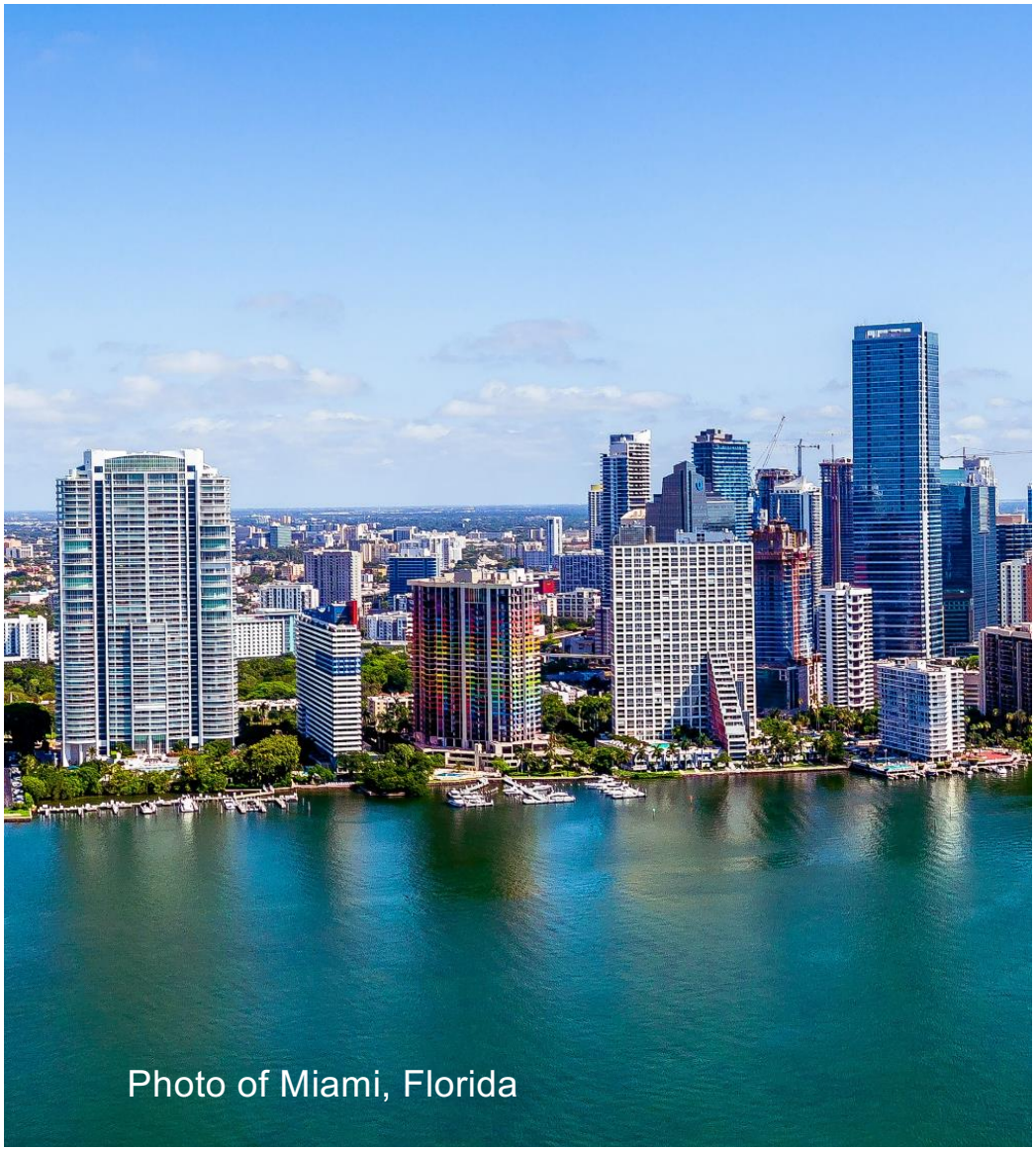


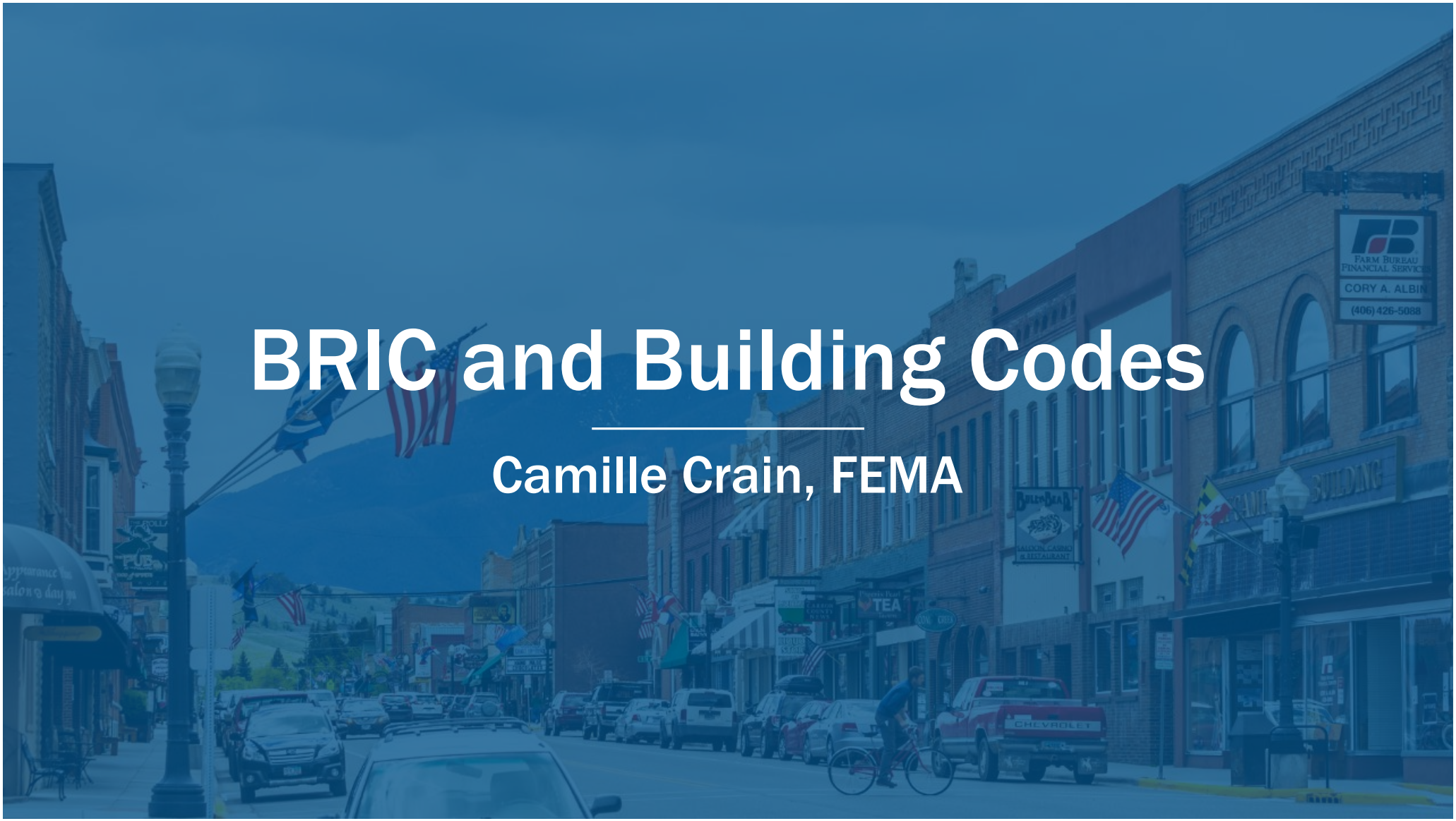
Photo of Miami, Florida

Agenda

- **Welcome:**
  Carlos J. Castillo, FEMA
- **BRIC and Building Codes:**
  Camille Crain, FEMA
- **Building Codes and Resilience:**
  John Ingargiola, FEMA Building Science Branch
- **Industry Perspectives:**
  Gabe Maser, International Code Council
  Pam Williams, BuildStrong

Carlos J. Castillo

Deputy Administrator, Resilience



BRIC and Building Codes

Camille Crain, FEMA

Building Codes

- DRRA provides legislative mandate to support broader adoption of updated building codes
- Projects must conform with latest published codes (either of two most recently published editions)
- BRIC will fund building code activity

Leverage references like the National Building Code Assessment Report, https://www.isomitigation.com/siteassets/downloads/iso-bcegs-state-report_web.pdf

Building Code Effectiveness Grading Schedule (BCEGS)

- An independent assessment of a community's building code adoption and enforcement activities, resulting in a score of 1 (best) to 10
- BCEGS surveys are provided at no cost and do not negatively impact credit ratings
  - Generally take 2-4 months to complete, so communities are encouraged to initiate the process **as soon as possible**

More Information on BCEGS Surveys

To request a BCEGS survey, refer to the submission instructions referenced on the ISO-Mitigation website: https://www.isomitigation.com/bcegs/

Questions about the BCEGS survey can be directed to BCEGS_Info@verisk.com

Building code activities are eligible for funding under Capability- and Capacity-Building

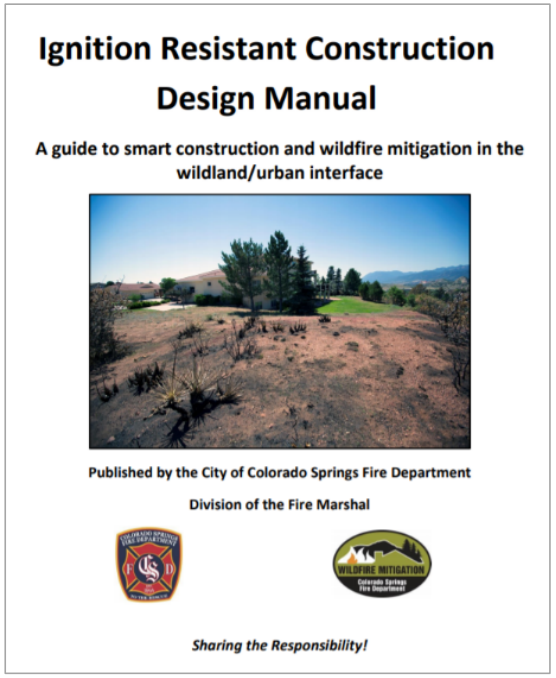
Example Building Code Adoption and Enforcement Activities

Evaluate adoption and/or implementation of codes that reduce risk

Enhance existing adopted codes to incorporate more current requirements or higher standards

Develop professional workforce capabilities through technical assistance and training

Building Codes Case Study



FEMA "Colorado Wildfire Mitigation, Strategies Tested and Lessons Learned" video available at: https://www.youtube.com/watch?v=IiyA-PEIzVI

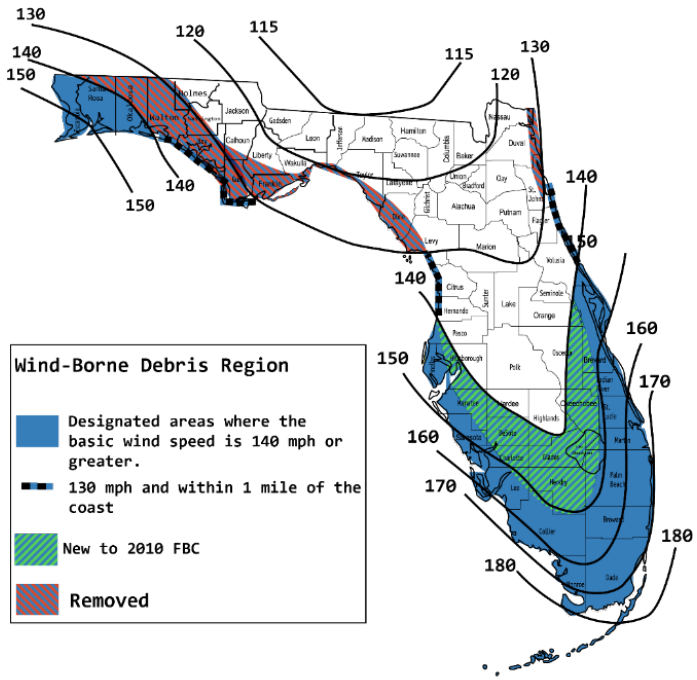
FEMA Story Map on Colorado Springs Wildfire Mitigation available at: https://fema.maps.arcgis.com/apps/MapSeries/index.html?appid=329347c89a774b378cea8829f67ce2cb

Colorado Springs Wildfire Mitigation

Colorado Springs, CO

Building Codes Case Study

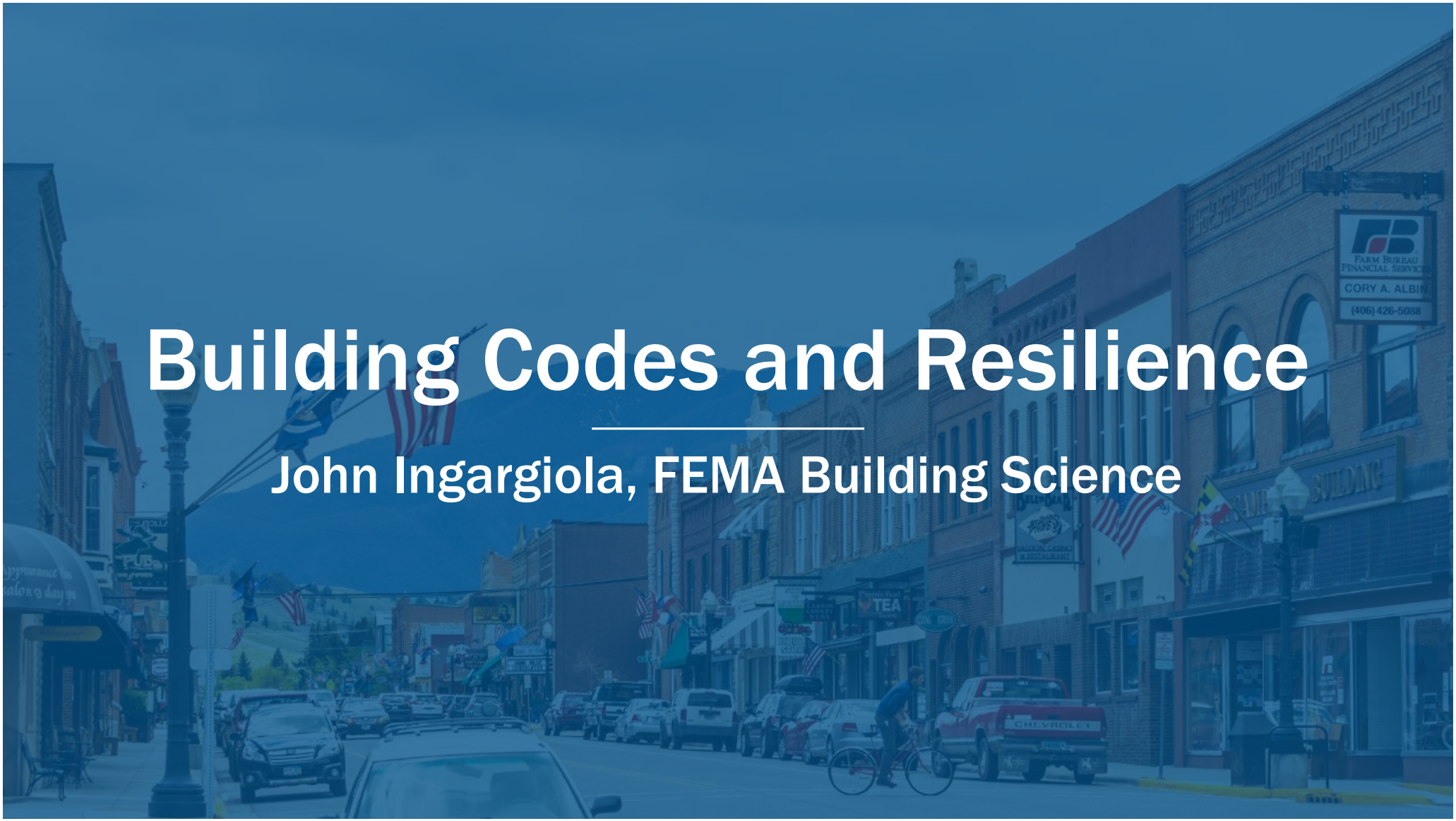
Florida Building Code Wind Standard (2010)



https://codes.iccsafe.org/category/Florida

Florida Building Codes

State of Florida



Building Codes and Resilience

John Ingargiola, FEMA Building Science

Mitigation Saves 2.0 Reports

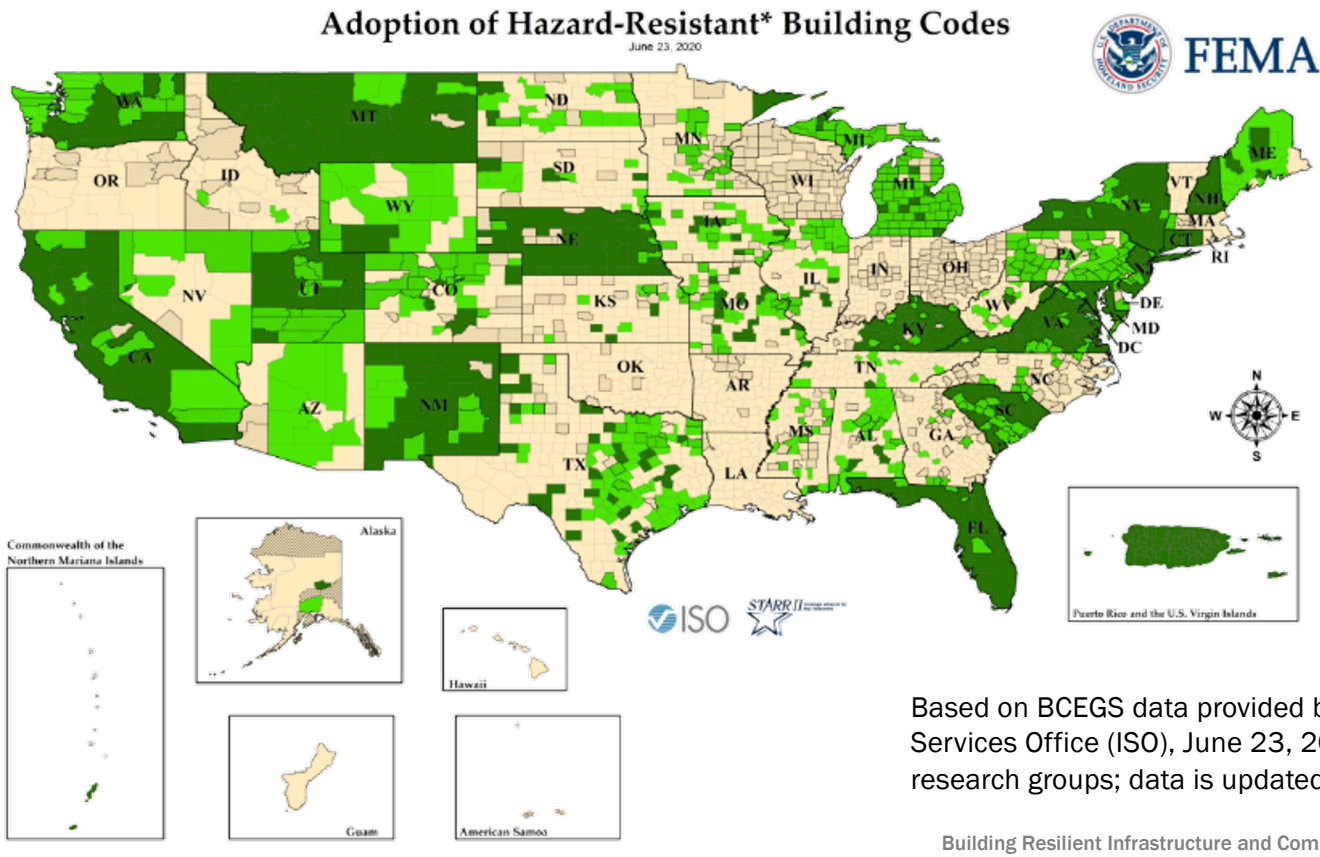
Research Has Shown the Value of Hazard-Resistant Building Code Adoption and Enforcement

National Benefit-Cost Ratio Per Peril *BCR numbers in this study have been rounded	Exceed common code requirements	Meet common code requirements	Utilities and transportation	Federally funded
Overall Hazard Benefit-Cost Ratio	4:1	11:1	4:1	6:1
Riverine Flood	5:1	6:1	8:1	7:1
Hurricane Surge	7:1	Not applicable	Not applicable	Too few grants
Wind	5:1	10:1	7:1	5:1
Earthquake	4:1	12:1	3:1	3:1
Wildland-Urban Interface Fire	4:1	Not applicable	Not applicable	3:1

National Institute of BUILDING SCIENCES™

Current Building Code Adoption Landscape

Hazard Resistance for At-Risk Counties using the 2015 or later IBC/IRC



Based on BCEGS data provided by Insurance Services Office (ISO), June 23, 2020, or other research groups; data is updated quarterly

Find your Building Codes

InspectToProtect.org

- Local code awareness outreach program run by FLASH

codes.iccsafe.org

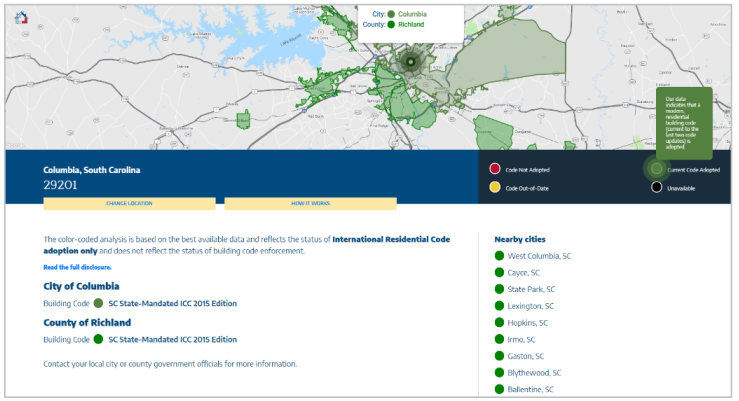
- International Code Council's code adoption map

geo.stantec.com/National_BCATS_Portal/viewer

- New BCATS WebGIS Portal

www.verisk.com/siteassets/media/downloads/underwriting/location/2019-bcegs-schedule.pdf

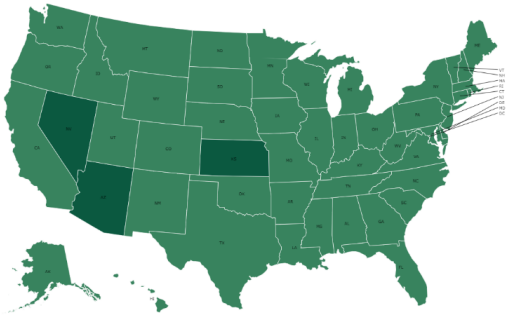
- National Building Code Assessment Report



Find Your Codes: InspectToProtect.org

Find Your Codes

Find Codes by State

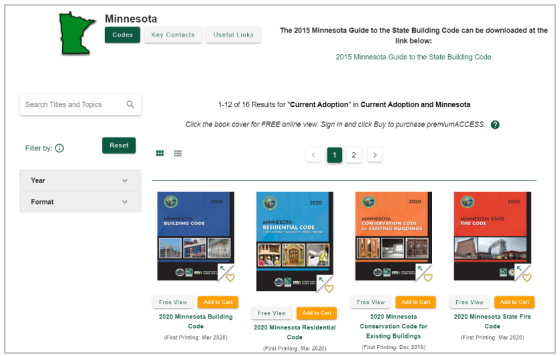


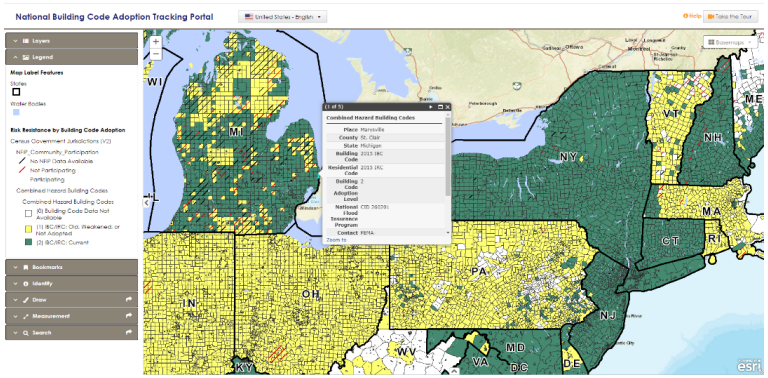
Statewide adoption of one or more ICC Codes (also includes locally adopted codes)

States where ICC Codes are adopted at the local level by jurisdictions

ICC Digital Codes Library

codes.iccsafe.org





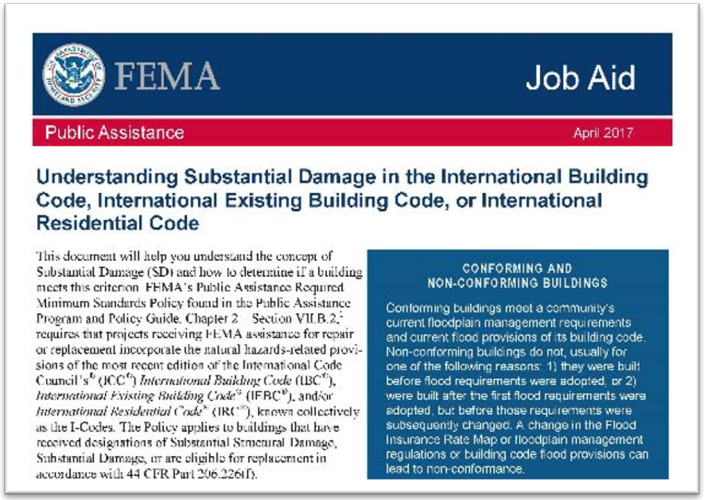
BCATS WebGIS Portal

geo.stantec.com/National_BCATS_Portal/viewer

Advancement of Building Codes

Latest consensus-based codes and standards are:

- an increasingly key part of federal disaster recovery policy;
- widely incorporated across FEMA programs and initiatives; and
- informing state/local building code initiatives.



FEMA Job Aid

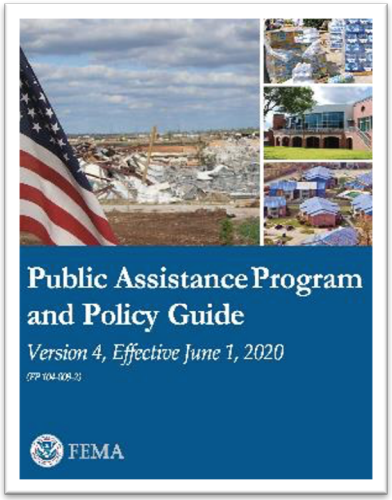
Public Assistance April 2017

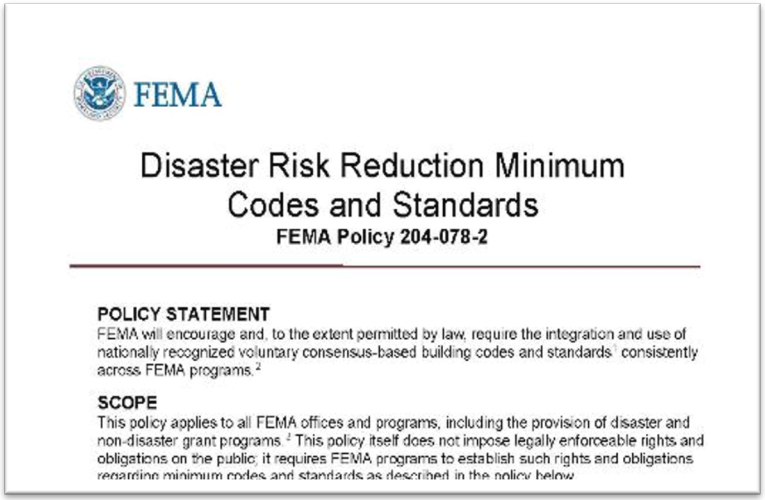
Understanding Substantial Damage in the International Building Code, International Existing Building Code, or International Residential Code

This document will help you understand the concept of Substantial Damage (SD) and how to determine if a building meets this criterion. FEMA's Public Assistance Required Minimum Standards Policy found in the Public Assistance Program and Policy Guide, Chapter 2 Section VII.B.2,[1] requires that projects receiving FEMA assistance for repair or replacement incorporate the natural hazards-related provisions of the most recent edition of the International Code Council's[6] (ICC®) *International Building Code* (IBC®), *International Existing Building Code*[2] (IEBC®), and/or *International Residential Code*[3] (IRC®), known collectively as the I-Codes. The Policy applies to buildings that have received designations of Substantial Structural Damage, Substantial Damage, or are eligible for replacement in accordance with 44 CFR Part 206.226(f).

CONFORMING AND NON-CONFORMING BUILDINGS

Conforming buildings meet a community's current floodplain management requirements and current flood provisions of its building code. Non-conforming buildings do not, usually for one of the following reasons: 1) they were built before flood requirements were adopted, or 2) were built after the first flood requirements were adopted, but before those requirements were subsequently changed. A change in the Flood Insurance Rate Map or floodplain management regulations or building code flood provisions can lead to non-conformance.





FEMA

Disaster Risk Reduction Minimum Codes and Standards

FEMA Policy 204-078-2

POLICY STATEMENT

FEMA will encourage and, to the extent permitted by law, require the integration and use of nationally recognized voluntary consensus-based building codes and standards[1] consistently across FEMA programs.[2]

SCOPE

This policy applies to all FEMA offices and programs, including the provision of disaster and non-disaster grant programs.[3] This policy itself does not impose legally enforceable rights and obligations on the public; it requires FEMA programs to establish such rights and obligations regarding minimum codes and standards as described in the policy below.

Application: Best Practices on Building Codes

Improve your **ISO BCEGS** classification. A community's BCEGS classification is based on:

Administration of codes, including:

- building code edition in use
- modification of the codes
- zoning provisions to mitigate natural hazards
- training of code enforcers
- certification of code enforcers
- incentives for outside education/certification
- building officials' qualifications
- contractor/builder licensing and bonding
- public awareness programs
- participation in code development activities and the appeal process

Review of building plans, including:

- staffing levels
- qualifications
- level of detail of plan review
- performance evaluations
- review of plans for one- and two-family dwellings, multifamily dwellings, and commercial buildings

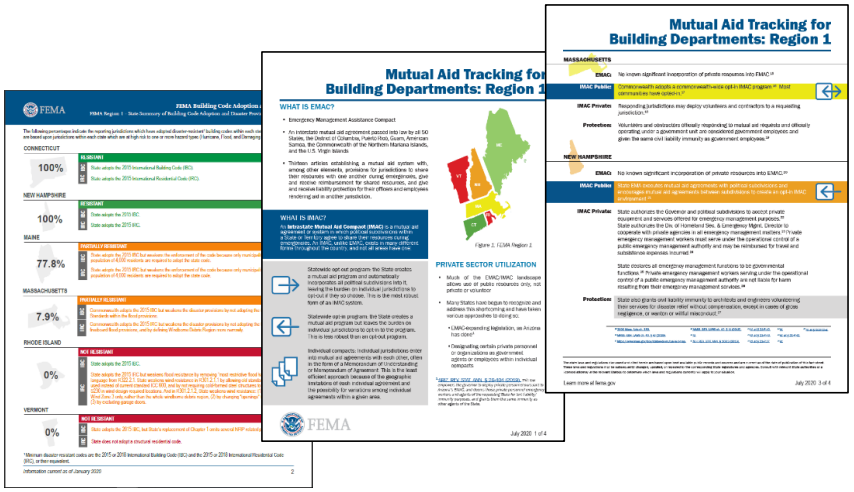
Field inspections, including:

- staffing levels
- qualifications
- level of detail of inspections
- performance evaluations
- final inspections
- issuance of certificates of occupancy

Application Resources: Regional Resources

Regional Reports and Fact Sheets

- Provide a high-level overview of the status of disaster-resistant building code adoption and mutual aid emergency responder legislation in each state and territory within a Region



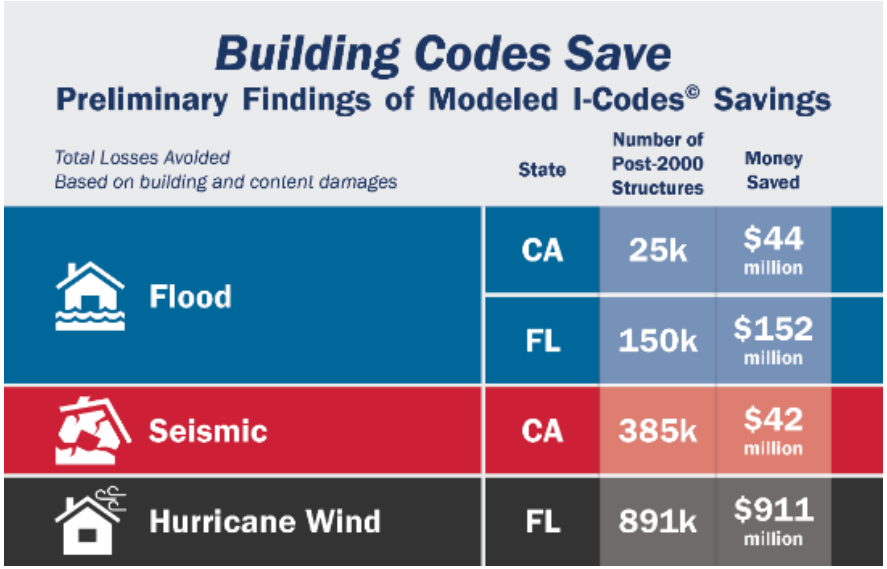
Regional Building Science Contacts:

- Region 1 – John Grace (John.Grace@fema.dhs.gov)
- Region 2 – Yana Tukvachinski (Yana.Tukvachinski@fema.dhs.gov)
- Region 3 – Charles “Charlie” Baker (Charles.Baker@fema.dhs.gov)
- Region 4 – John “Bud” Plisich (John.Plisich@fema.dhs.gov)
- Region 5 – Pamela Broviak (Pamela.Broviak@fema.dhs.gov)
- Region 6 – Don Leifheit, Jr. (Donald.Leifheitjr@fema.dhs.gov)
- Region 7 – Andy Megrail (Andy.Megrail@fema.dhs.gov)
- Region 8 – Sean McGowan (Sean.McGowan@fema.dhs.gov)
- Region 9 – Michael Hornick (Michael.Hornick@fema.dhs.gov)
- Region 10 – Amanda Siok (Amanda.Siok@fema.dhs.gov)

National Loss Avoidance Study: Building Codes Save

FEMA *Building Codes Save: A Nationwide Study of Loss Prevention*

- Quantifies economic losses avoided from state and local adoption of modern hazard-resistant building codes and standards
- Adopting hazard-resistant codes will **avoid billions of dollars in future losses** and provide a sustainable return on hazard mitigation investment
- Full Report Fall 2020



https://www.fema.gov/building-codes-save-nationwide-study-loss-prevention

Building Code Resources

www.fema.gov/building-code-resources

If you need additional information:

FEMA-Buildingsciencehelp@fema.dhs.gov

Building Science Helpline: (866) 927-2104

Other Resources:

- FEMA Building Codes Toolkit
  https://www.fema.gov/building-codes-toolkit
- ISO Mitigation – Building Codes
  https://www.isomitigation.com/bcegs/

Industry Perspectives

Gabe Maser, ICC

The International Code Council (ICC)

- 64,000+ members including building officials, fire services, builders, architects, engineers, and industry representatives
- Facilitates the development of model codes that help ensure building safety, resiliency, and sustainability
- Codes are adopted or in use in every state and territory as well as in federal buildings, domestic military bases, and our country's embassies abroad

Building Codes Mitigate Hazards

- Reduced avg claims post-Hurricane Harvey 90%
- $1B in future annual losses avoided in Florida and California per FEMA
- ROI: $11:1 (IBC/IRC), $4:1 (IWUIC) per NIBS
- Reduced windstorm losses by 72% since Florida's statewide code
- Reduced hail damage 10-20% in Missouri

Code Enforcement is Critical

- Challenges preceding Hurricanes Andrew and Hugo as well the Northridge earthquake
  - Could have accounted for one-quarter of the $16B in damages in Dade County
- 25 years after Hurricane Andrew, researchers find effective enforcement can reduce losses 15-25%

Code Implementation Considerations

- Variations in code adoption
  - Statewide, home rule, hybrid models
  - Amendments
  - Editions
- Legislative vs. regulatory updates
- Enforcement

Codes and Housing Affordability

- Negligible implications for home sales
  - Post adoption analysis in Moore, OK – no impact on sales or $ per sqft
  - NIBS review – 0.5% increase in purchase price over 30 yrs
  - ASFPM analysis – insurance savings can reduce net monthly mortgage and flood insurance costs by >5%
- Resilience premium
  - 6% for hurricane shutters, 4% for tornado shelters

Building Code Requirements and Incentives

- FEMA Programs
  - Post-disaster minimum standards
  - Post-disaster cost-share
  - Pre-disaster mitigation grants
  - NFIP/CRS
- Private Sector Too!

Leveraging BRIC to Strengthen Codes and Promote Community Resilience

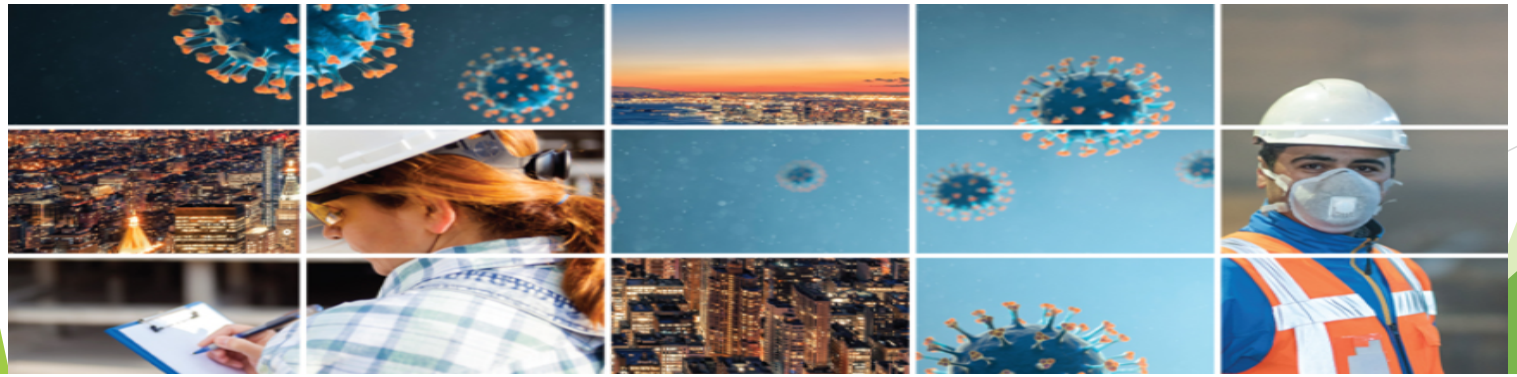
- Potential activities
  - Code adoption/updating (development and implementation costs)
  - Code enforcement (incl. e-permitting/plan review, remote virtual inspections)
  - Training and certifications
- Low cost/extensive benefits

Code Department Virtual Needs

- Spring survey of 1150 jurisdictions
  - Nearly all still operating but 2/3s working remotely
  - 2/10 lacked needed hard copy code books
  - 3/10 lacked e-permitting capability and 4/10 e-plan review capability
  - 6/10 lacked the capability to conduct virtual inspections

Addressing Virtual Needs

- Code officials are essential to health and safety
  - Safe construction of temporary structures to provide medical surge capacity
  - Proper operation of ventilation disinfection systems
- Facilitate construction essential to response/recovery
  - Lack of virtual capabilities has contributed to plan review and inspection delays



Resources and Contact Info

Code Resources

- Mitigation benefits and adoption info
- Affordability
- Regional ICC staff

Virtual Capabilities

- Survey results
- Going virtual (white papers, webinars, and jurisdictions' approaches); digital codes; e-permitting; online testing; and online training

Gabe Maser

Vice President, Government Relations

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202-730-3953

Industry Perspectives

Pam Williams, BuildStrong

The Adoption and Enforcement of Building Codes…

BUILDSTRONG COALITION

Represent one of the most significant changes a community can implement to drive disaster resilience

Who We Are...

BUILDSTRONG COALITION

The BuildStrong Coalition, formed in 2011 to respond to an increasing number of severe disasters, is made up of a diverse group of members representing firefighters, emergency responders, emergency managers, insurers, engineers, architects, contractors, and manufacturers, as well as consumer organizations, code specialists, and many others committed to building a

more disaster resilient nation.

Significant Interrelated Reforms

BUILDSTRONG COALITION

- DRRA implemented dozens of interrelated provisions that can be leveraged together and **with other programs** to facilitate, promote, encourage, and incentivize resiliency while removing impediments, roadblocks, and disincentives
- Flexibilities to develop partnerships with the private sector to create creative, transformational solutions

BUILDSTRONG COALITION

Building Codes Build Resilience

Building Codes are a Good Investment

According to a December 2018 report from the National Institute of Building Sciences (NIBS), the **benefit-cost ratios for mitigation strategies** studied found:

Adopting Model Codes Saves	$11 per $1 Spent
Federal Mitigation Grants Save	$6 per $1 Spent
Exceeding Codes Saves	$4 per $1 Spent
Mitigating Infrastructure Saves	$4 per $1 Spent

Building Codes…

Protect our lives, property, and money!

- Reduce property and financial loss.
- Get things up and running as quickly as possible to avoid property damage, loss of function, and loss of business.
- Minimized damage protects the community tax base.
- Reduced risk can reduce insurance premiums.

Residential Resilience

- **IBHS:** Cost-effective, risk reducing projects homeowners can undertake to dramatically decrease their risk exposure
- **State Residential Resilience Grant Programs**
  - Strengthen Alabama
    https://strengthenalabamahomes.com/
  - California Residential Mitigation Program
    https://www.earthquakebracebolt.com/

Building Partnerships

BUILDSTRONG COALITION

Cultivating your partners and stakeholders:

- ✓ Increase community-wide, systemic resilience and safety
- ✓ Partnerships for code adoption and implementation
- ✓ Help with project identification, development, and implementation
- ✓ Gain access to coalitions to help assess community vulnerability and exposure to risk
- ✓ Increase access to creative and transformational solutions and financing
- ✓ Increase education and training resources, sharing of best practices and lessons learned
- ✓ Cultivate force multipliers and additional resources

Questions?

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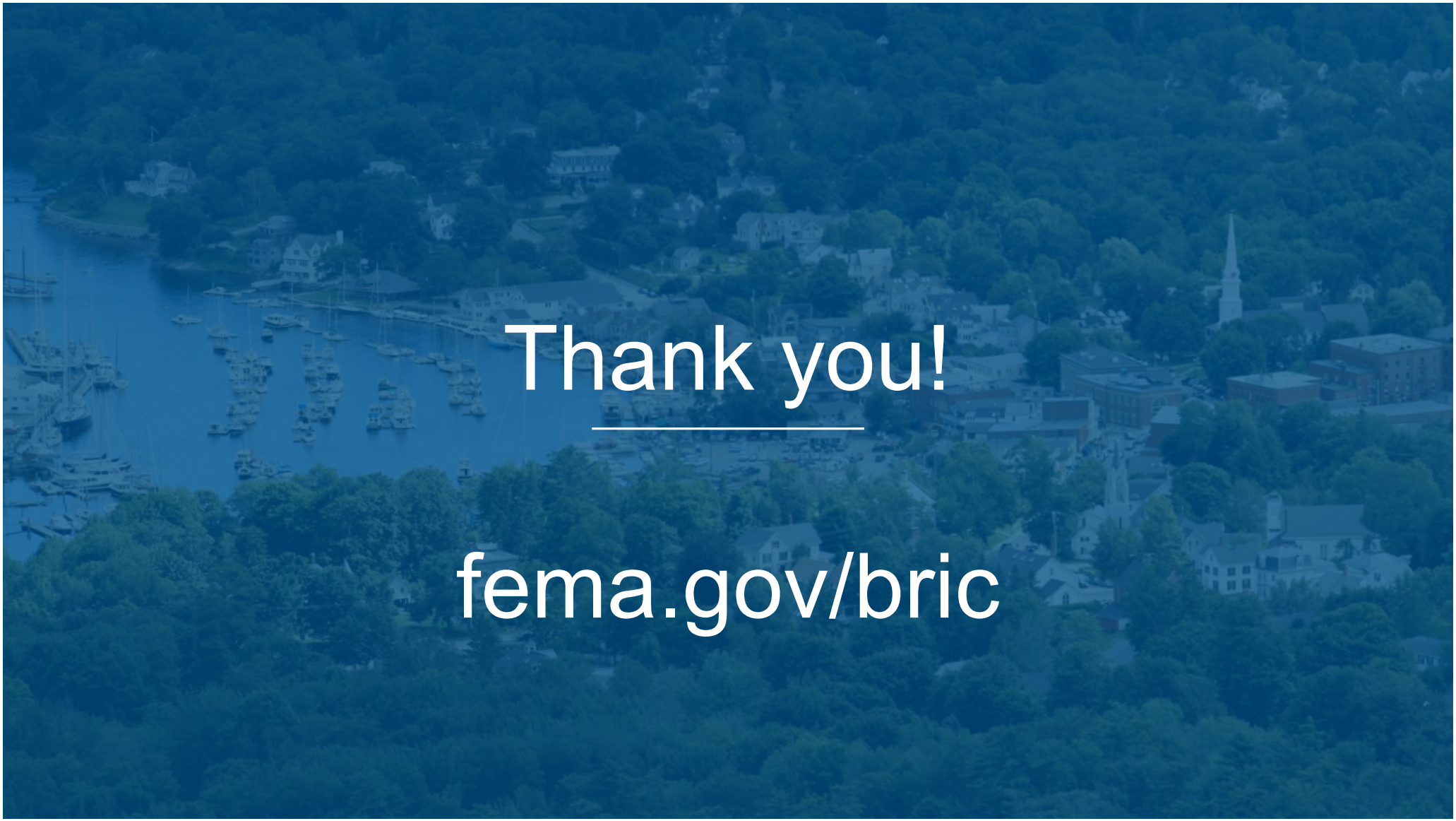
P 202.315.5100 | F 202.315.5010 | buildstrongamerica.com

BRIC Stakeholder Engagement Sessions

Purpose and Goals

- Educate stakeholders on all aspects of the BRIC policy and program
- Increase awareness and understanding of key BRIC program components
- BRIC Engagement Sessions – all about the BRIC program (July 2020)
  - July 1: Introduction to BRIC (recording available at: https://www.youtube.com/watch?v=X846TRnAnUw&t=2s)
  - July 8: Meaning of the BRIC Name
  - July 22: BRIC and Community Lifelines
  - July 29: BRIC and Nature-based Solutions
- BRIC NOFO Webinars – will occur after NOFO is released (August - September 2020)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fema.gov/bric